<u>Claims</u>

1.   (**Currently Amended**) A method of constructing a model operable to

generate one or more job performance criteria predictions based on input pre-hire

information, the method comprising:

electronically collecting pre-hire information from a plurality of applicants

wherein at least some of the pre-hire information is collected from at least one of the

applicants who responds directly on an electronic device **to provide pre-hire applicant**

responses to questions;

collecting post-hire information for the applicants based on job performance of the

applicants after hire; ~~, wherein collecting post-hire information comprises receiving~~

~~payroll information for the applicants via a network, determining a termination~~

~~date for an applicant from the payroll information received via the network, and~~

~~determining tenure of the applicant by comparing the termination date with a~~

~~hiring date of the applicant; and~~

via information-theoretic feature selection, choosing questions from the pre-

hire information as features for which respective pre-hire applicant responses serve

as inputs to the model, wherein the information-theoretic feature selection

comprises identifying at least one higher-order interaction comprising a set of a

plurality of questions having higher predictive power than a sum of predictive

powers of individual questions in the set; and

from the pre-hire information and the post-hire information, ~~generating~~ **training**

an artificial intelligence-based predictive model in a computer-readable medium **with**

observed pre-hire applicant responses for the chosen features, wherein the artificial

intelligence-based predictive model is operable to generate one or more job performance

criteria predictions comprising tenure based **at least** on input pre-hire information from

new applicants **corresponding to the chosen features**, whereby the one or more job

performance criteria predictions are usable as a basis for a hiring recommendation or

other employee selection information.

2.   **(Currently Amended)** A computer-readable medium comprising

computer-executable instructions for performing a method of constructing a model

operable to generate one or more job performance criteria predictions based on input pre-

hire information, the method comprising:

electronically collecting pre-hire information from a plurality of applicants

wherein at least some of the pre-hire information is collected from at least one of the

applicants who responds directly on an electronic device to provide pre-hire

applicant responses to questions;

collecting post-hire information for the applicants based on job performance of the

applicants after hire**;** ~~, wherein collecting post-hire information comprises receiving~~

~~payroll information for the applicants via a network, determining a termination date for~~

~~an applicant from the payroll information received via the network, and determining~~

~~tenure of the applicant by comparing the termination date with a hiring date of the~~

~~applicant; and~~

via information-theoretic feature selection, choosing questions from the pre-hire information as features for which respective pre-hire applicant responses serve as inputs to the model, wherein the information-theoretic feature selection comprises identifying at least one higher-order interaction comprising a set of a plurality of questions having higher predictive power than a sum of predictive powers of individual questions in the set; and

from the pre-hire information and the post-hire information, ~~generating~~ **training** an artificial intelligence-based predictive model **with observed pre-hire applicant responses for the chosen features, wherein the artificial intelligence-based predictive model is** operable to generate one or more job performance criteria predictions comprising tenure based **at least** on input pre-hire information from new applicants **corresponding to the chosen features**.

3.   (Canceled)

4.   (Canceled)

5.   (Original) The method of claim 1 further comprising:

limiting the applicants for the model to those with a particular occupation; and

constructing the model as an occupationally-specialized model.

6.   (Original) The method of claim 1 wherein the model accepts one or more

inputs, the method further comprising:

identifying in the pre-hire information one or more characteristics that are

ineffective predictors; and

omitting the ineffective predictors as inputs to the model.

7.   (Original) The method of claim 1 wherein the pre-hire information

comprises one or more characteristics, the method further comprising:

identifying in the pre-hire information one or more characteristics that are

ineffective predictors; and

providing an indication that the characteristics no longer need to be collected.

8.   (Previously Presented) The method of claim 1 wherein job performance

criteria predictions comprise a prediction indicating whether a job candidate will be

voluntarily terminated.

9.   (Previously Presented) The method of claim 1 wherein job performance

criteria predictions comprise a prediction indicating whether a job candidate will be

eligible for rehire after termination.

10.   (Previously Presented) The method of claim 1 wherein the pre-hire

information comprises one or more characteristics, the method further comprising:

identifying in the pre-hire information one or more characteristics that are

ineffective predictors;

responsive to identifying the ineffective predictors, collecting new pre-hire

information not including the ineffective predictors; and

building a refined model based on the new pre-hire information.

11.   (Original) The method of claim 10 further comprising:

adding one or more new characteristics to be collected when collecting the new

pre-hire information.

12.   (Original) The method of claim 11 further comprising:

evaluating the effectiveness of the new characteristics.

13.   (Canceled)

14.   (Canceled)

15.   (**Currently Amended**) A method for constructing an artificial

intelligence-based employment selection process based on pre-hire information

comprising personal employee characteristics and post-hire information comprising

employee job performance observation information, the method comprising:

via information-theoretic feature selection, choosing questions from the pre-

hire information as chosen features for which respective pre-hire applicant

responses serve as inputs to predictive artificial models, wherein the information-

theoretic feature selection comprises identifying at least one higher-order

interaction comprising a set of a plurality of questions having higher predictive

power than a sum of predictive powers of individual questions in the set;

generating a plurality of predictive artificial intelligence models **accepting the**

chosen features as inputs, based on the pre-hire and post-hire information, wherein at

least two of the artificial intelligence models are of different feed-forward types and

different architectures;

testing effectiveness of the models to select an effective model; and

applying the effective model to predict post-hire information not yet observed,

whereby the post-hire information not yet observed that is predicted by the effective

model can be a basis for a hiring recommendation or other employee selection

information.

16.   (Canceled)

17.   (Previously Presented) The method of claim 15 wherein at least one of the

models is an expert system.

18.   (Canceled)

19.   (Canceled)

20.   (Canceled)

21.   (Original) The method of claim 15 further comprising:

identifying at least one of the models as exhibiting impermissible bias; and

avoiding use of the models exhibiting impermissible bias.

22.   **(Canceled)**

23.   (**Currently Amended**) A computer-implemented method of refining an artificial-intelligence based employee performance selection system, the method comprising:

collecting information via an electronic device presenting a set of questions to employment candidates, wherein the questions are stored in a computer-readable medium;

collecting post-hire information for the employment candidates based on job performance of the employment candidates after hire, wherein collecting post-hire information comprises receiving payroll information for the employment candidates via a network, determining a termination date for an employment candidate from the payroll information received via the network, and determining tenure of the employment candidate by comparing the termination date with a hiring date of the applicant;

testing effectiveness of at least one of the questions in predicting tenure**, wherein testing effectiveness comprises considering various sets of permutations of predictive items comprising the at least one of the questions, wherein the at least one of the questions alone is ineffective but is effective in combination with one or more other items**; and

responsive to determining the question is ineffective in predicting tenure, deleting the question from the computer-readable medium.

24.   (Canceled)

25.   (**Currently Amended**) A computer-readable medium comprising a predictive model, the model comprising:

inputs for accepting one or more characteristics based on pre-hire information for a job applicant**, wherein at least one of the inputs is chosen via information-theoretic feature selection and corresponds to a question for which pre-hire applicant responses have been collected, wherein the information-theoretic feature selection comprises identifying at least one higher-order interaction comprising a set of a plurality of questions having higher predictive power than a sum of predictive powers of individual questions in the set**; and

one or more predictive outputs indicating one or more predicted job effectiveness criteria based on the inputs,

wherein the predictive model is an artificial intelligence-based model constructed from pre-hire data electronically collected from a plurality of employees and post-hire data, and the model generates its predictive outputs based on the similarity of the inputs to pre-hire data collected for the plurality of employees and their respective post-hire data; and

wherein the one or more predicted job effectiveness criteria comprise at least one selected from the group consisting of:

whether the job applicant will be involuntarily terminated, and whether the job applicant will be eligible for rehire upon termination.

26.   (Original) The computer-readable medium of claim 25 wherein the predictive model comprises a predictive output indicating a rank for the job applicant.

27.   (Original) The computer-readable medium of claim 26 wherein the rank is relative to other applicants.

28.   (Original) The computer-readable medium of claim 26 wherein the rank is relative to the plurality of employees.

29.   (Original) The computer-readable medium of claim 25 wherein the predictive model comprises a predictive output indicating probability of group membership for the job applicant.

30.   (Original) The computer-readable medium of claim 25 wherein the predictive model comprises a predictive output indicating predicted tenure for the job applicant.

31.   (Canceled)

32.   (Original) The computer-readable medium of claim 25 wherein the predictive model comprises a predictive output indicating predicted number of accidents for the job applicant.

33.   (Original) The computer-readable medium of claim 25 wherein the predictive model comprises a predictive output indicating whether the applicant will be involuntarily terminated.

34.   (Original) The computer-readable medium of claim 25 wherein the predictive model comprises a predictive output indicating whether the applicant will be eligible for rehire after termination.

35.   (Canceled)

36.   (Canceled)

37.   (Previously Presented) A computer-readable medium comprising a refined

predictive artificial intelligence-based model, the model comprising:

inputs for accepting one or more characteristics based on pre-hire information for

a job applicant, **wherein at least one of the inputs is chosen via information-theoretic**

feature selection and corresponds to a question for which pre-hire applicant

responses have been collected, wherein the information-theoretic feature selection

comprises identifying at least one higher-order interaction comprising a set of a

plurality of questions having higher predictive power than a sum of predictive

powers of individual questions in the set; and

one or more predictive outputs indicating one or more predicted job effectiveness

criteria based on the inputs;

wherein the one or more predictive outputs are configured to predict whether the

job applicant will be involuntarily terminated or whether the job applicant will be eligible

for rehire upon termination, and

wherein the predictive model is constructed from pre-hire data electronically

collected from a plurality of employees and post-hire data, wherein the pre-hire data is

based on a question set refined by having identified and removed one or more questions

as ineffective.

38.   (Canceled)

39. (Canceled)

40. **(Currently Amended)** An apparatus for assisting in determining the suitability of an individual for employment by an employer, the apparatus comprising:

a computer-readable medium comprising a predictive model comprising:

inputs for accepting one or more characteristics based on pre-hire information for a job applicant, **wherein at least one of the inputs is chosen via information-theoretic feature selection and corresponds to a question for which pre-hire applicant responses have been collected, wherein the information-theoretic feature selection comprises identifying at least one higher-order interaction comprising a set of a plurality of questions having higher predictive power than a sum of predictive powers of individual questions in the set**; and

one or more predictive outputs indicating one or more predicted job effectiveness criteria based on the inputs, wherein the predictive model is an artificial intelligence-based model constructed from pre-hire data electronically collected from a plurality of employees and post-hire data, and the model generates its predictive outputs based on the similarity of the inputs to pre-hire data collected for the plurality of employees and their respective post-hire data; wherein the one or more predicted job effectiveness criteria comprise at least one selected from the group consisting of: whether the job applicant will be involuntarily terminated, and whether the job applicant will be eligible for rehire upon termination;

electronic data interrogator means for presenting a first set of a plurality of means

for questioning to the individual;

electronic answer capturer means for electronically storing answers by the

individual to at least a selected plurality of the first set of means for questioning

presented to the individual;

electronic predictor means responsive to the stored answers and for predicting at

least one post-hire outcome if the individual were to be employed by the employer, the

predictor providing a prediction of the outcome based upon correlations of the stored

answers with answers to sets of means for questioning by other individuals for which

post-hire information has been collected;

electronic results provider means for providing an output indicative of the

outcome to assist in determining the suitability of the individual for employment by the

employer.

41.   (**Currently Amended**) An apparatus for assisting in determining the

suitability of an individual for employment by an employer, the apparatus comprising:

an electronic device for presenting a first set of a plurality of means for

questioning to the individual;

means for electronically storing answers by the individual to at least a selected

plurality of the first set of means for questioning presented to the individual;

means responsive to the stored answers and for predicting at least one post-hire outcome if the individual were to be employed by the employer, the predictor providing a prediction of the outcome based upon correlations of the stored answers with answers to sets of means for questioning by other individuals for which post-hire information has been collected; and

means for providing an output indicative of the outcome to assist in determining the suitability of the individual for employment by the employer,

wherein the apparatus comprises a predictive model comprising:

inputs for accepting one or more characteristics based on pre-hire information for a job applicant, **wherein at least one of the inputs is chosen via information-theoretic feature selection and corresponds to a question for which pre-hire applicant responses have been collected, wherein the information-theoretic feature selection comprises identifying at least one higher-order interaction comprising a set of a plurality of questions having higher predictive power than a sum of predictive powers of individual questions in the set**; and

one or more predictive outputs indicating one or more predicted job effectiveness criteria based on the inputs,

wherein the predictive model is an artificial intelligence-based model constructed from pre-hire data electronically collected from a plurality of employees and post-hire data, and the model generates its predictive outputs based on the similarity of the inputs to pre-hire data collected for the plurality of employees and their respective post-hire data; and

wherein the one or more predicted job effectiveness criteria comprise at least one selected from the group consisting of:

whether the job applicant will be involuntarily terminated, and whether the job applicant will be eligible for rehire upon termination.

42.   (Canceled)

43.   (Previously Presented) The computer-readable medium of claim 37 wherein the ineffective questions are identified via an information transfer technique comprising:

considering various sets of permutations of answers to questions;

evaluating whether the sets of permutations are effective; and

determining whether an answer to a question is not in any effective set of permutations.

44.   (**Currently Amended**) The method of claim ~~1~~ **46** wherein collecting post-hire information further comprises:

tracking whether the applicant has been dropped from payroll.

45.   (Previously Presented) The method of claim 21 wherein:

the identifying comprises comparing across gender, ethnicity, or age differences.

46.   (**New**) The method of claim 1 wherein:

collecting post-hire information comprises receiving payroll information for the applicants via a network, determining a termination date for an applicant from the payroll information received via the network, and determining tenure of the applicant by comparing the termination date with a hiring date of the applicant.

47.   (**New**) The method of claim 1 wherein:

the set of the plurality of questions having higher predictive power than the sum of predictive powers of individual questions in the set comprises at least one biodata question and at least one psychometric question.

48.   (**New**) The method of claim 1 wherein identifying at least one higher-order interaction comprises:

generating an approximation of an optimal subset of quetsions for use as input features for the model.

49.   (**New**) The method of claim 48 wherein generating an approximation of an optimal subset of questions comprises:

determining a union of a set of questions appearing in predictive transmissions of greatest magnitude.

50.   (**New**) The method of claim 48 wherein generating an approximation of an optimal subset of questions comprises:

from a set of transmissions T_k, choosing *m* unique transmissions of greatest magnitude as a base set for higher-order transmissions;

generating T'_{k+1}, by adding questions to members of T_k, that generate a set T'_{k+1} with largest transmission values; and

taking a union of questions appearing in the unique transmissions of greatest magnitude, wherein the union approximates the optimal subset of questions.